

Claims

1. A wheel folding apparatus, having a cutting device (11, 12, 13, 11, 34, 36) for the transverse cutting of at least one web (03, 04) of material, having a transport cylinder (11) with two folding rollers (17, 18) forming a folding gap (19), wherein the transport cylinder (11) is arranged to form a first folding gap (08) together with a first counter cylinder (12, 34), characterized in that the transport cylinder (11) is additionally arranged to form a second folding gap (09) together with a second counter cylinder (13, 36).

2. The wheel folding apparatus in accordance with claim 1, characterized in that each of the counter cylinders (12, 13) is a cutting cylinder (12, 13).

3. The wheel folding apparatus in accordance with claim 1, characterized in that the transport cylinder (11) has stops (33) for the cutters (14) of the cutting cylinders (12, 13).

4. The wheel folding apparatus in accordance with claim 1, characterized in that the first counter cylinder (12, 34) works together with the transport cylinder (11) for cutting through a first web (03) of material, and the second counter cylinder (13, 36) works together with the transport cylinder (11) for cutting through the second web (04) of material.

5. The wheel folding apparatus in accordance with claim 1, characterized in that the counter cylinders (12, 13, 34, 36) are arranged on the circumference of the transport cylinder (11) for phase-shifted cutting.

6. The wheel folding apparatus in accordance with claim 5, characterized in that on the transport cylinder (11) the cut in the first cutting gap (08) takes place close to, in particular less than 10 mm, next to a cut in the second cutting gap (09).

7. The wheel folding apparatus in accordance with claim 1, characterized in that the counter cylinders (12, 13, 34, 36) are arranged on the transport cylinder (11) offset in the circumferential direction.

8. The wheel folding apparatus in accordance with claim 1, characterized in that a first transport track for a first web (03) of material to be cut extends through the first cutting gap (08), wherein the first cutting cylinder (12) has at least one cutter (14) for cutting a first signature (21) off the first web (03) of material in the course of the passage of the cutter (14) through the first cutting gap (08), that a second transport track of a second web (04) of material to be cut meets the first transport track at the transport cylinder (11), and both transport tracks pass through the second cutting gap (09), wherein the second cutting cylinder (13) has at least one cutter (14) for cutting a second signature (27) off the second web (04) of

material in the course of the passage of the cutter (14) through the second cutting gap (09).

9. The wheel folding apparatus in accordance with claim 8, characterized in that the rotation of the two cutting cylinders (12, 13) is synchronized in such a way that in the course of passing through the second cutting gap (09), the cutter (14) encounters a cut in the first web (03) of material created by the cutter (14) made in the first cutting gap (08).

10. The wheel folding apparatus in accordance with claim 9, characterized by means (16, 16', 16", 16*, 16**, 16***, 31, 32', 32") for moving apart the cut edges created by the first cutter (14) in the course of cutting the first web (03) of material.

11. The wheel folding apparatus in accordance with claim 10, characterized in that the means (16, 16', 16", 16*, 16**, 16***, 31, 32', 32") for moving apart the cut edges comprise a holding device (16", 16**) for holding the cut-off first signature (21) and for shifting the first signature (21) opposite the transport direction prior to reaching the second cutting gap (09).

12. The wheel folding apparatus in accordance with claim 10 or 11, characterized in that the means (16, 16', 16", 16*, 16**, 16***, 31, 32', 32") for moving apart the cut edges comprise a holding device (16''', 16***) for holding the cut-off second signature (27) and for shifting the second

signature (27) in the transport direction after the passage through the second cutting gap (09).

13. The wheel folding apparatus in accordance with claim 1, characterized in that the transport cylinder (11) supports at least one cutter (14).

14. The wheel folding apparatus in accordance with claim 13, characterized in that each of the counter cylinders (12, 13, 34, 36) has a stop (33) working together with the cutter (14).

15. The wheel folding apparatus in accordance with claim 13 or 14, characterized in that a first transport track for a first web (03) of material to be cut extends through the first cutting gap (08), that a second transport track of a second web (04) of material to be cut meets the first transport track at the transport cylinder (11), and both transport tracks pass through the second cutting gap (09).

16. The wheel folding apparatus in accordance with claim 1, characterized by a first counter cylinder (34), which is rotatable together with the transport cylinder (11) and delimits the first cutting gap (08), through which a first transport track for the first web (03) of material extends, wherein the transport cylinder (11) supports at least one cutter (14) for cutting a signature off the first web (03) of material in the course of the passage of the cutter (14) through the first cutting gap (08), and the counter cylinder (34) has a stop (33) working together with

the cutter (14), wherein the transport cylinder (11) has a holding device (16) for holding a cut off signature and transporting the signature through the first cutting gap (08), and that the first transport track loops around the first counter cylinder (34) in the entry to the first cutting gap (08).

17. The wheel folding apparatus in accordance with claim 10, 11, 12 or 16, characterized in that the holding device (16, 16', 16", 16*, 16**, 16***) is a spur strip (16, 16', 16", 16*, 16**, 16***).

18. The wheel folding apparatus in accordance with claim 17, characterized in that the spur strip (16, 16', 16", 16*, 16**, 16***), which supports spur needles (23) can be pivoted around a shaft (22), and that the spur needles (23) cross the circumference of the transport cylinder (11) at a location which is changeable in accordance with the pivot position of the spur strip (16, 16*).

19. The wheel folding apparatus in accordance with claim 12 and claim 17, characterized in that the spur strip (16, 16', 16", 16*, 16**, 16***), which supports spur needles (23) can be pivoted around a shaft (22) and that the tips of the spur needles (23) are at a greater distance from the shaft (22) than their bases.

20. The wheel folding apparatus in accordance with one of claims 10, 11, 12 or 16 to 19, characterized in that the means (16, 16', 16", 16*, 16**, 16***, 31, 32', 32") for

moving apart the cut edges are comprised of a radially displaceable segment (31, 32', 32") of the transport cylinder (11) and a control device for driving an outward movement of the segment (31, 32', 32") after the passage through the second cutting gap (09).

21. The wheel folding apparatus in accordance with one of claims 10, 11, 12 or 16 to 19, characterized in that the means (16, 16', 16", 16*, 16**, 16***, 31, 32', 32") for moving apart the cut edges comprise a groove (29) in the transport cylinder (11) and a strip (28) on the second cutting cylinder (13), which works together with the groove (29).

22. The wheel folding apparatus in accordance with one of claims 17 to 21, characterized in that the first counter cylinder (34) has at least one groove (24) for receiving the spur needles (23) of the spur strip (16).

23. The wheel folding apparatus in accordance with claims 13, 14 or 15, characterized in that the first transport track for a web (03) of material to be cut first loops around the first counter cylinder (34) at the entry to the first cutting gap (08).

24. The wheel folding apparatus in accordance with claim 1, characterized by a first counter cylinder (34), which is rotatable together with the transport cylinder (11) and delimits the first cutting gap (08), through which a first transport track for the first web (03) of material

extends, wherein the transport cylinder (11) supports at least one cutter (14) for cutting a signature off the first web (03) of material in the course of the passage of the cutter (14) through the first cutting gap (08), and the counter cylinder (34) has a stop (33) working together with the cutter (14), wherein a second transport track of a second web (04) of material to be cut meets the first transport track at the transport cylinder (11), and that a second counter cylinder (36) is rotatable together with the transport cylinder (11) and together with the latter delimits a second cutting gap (09) through which both transport tracks pass, wherein the second cutting cylinder (13) has a stop (33) which, for cutting the second signature off the second web (04) of material, works together with the cutter (14) in the course of the passage of the cutter (14) through the second cutting gap (09).

25. The wheel folding apparatus in accordance with one of the preceding claims, characterized in that the transport cylinder (11) has at least five, preferably seven fields.

26. The wheel folding apparatus in accordance with one of the preceding claims, characterized in that an inlet (01, 02) is assigned to each web (03, 04) of material.

27. The wheel folding apparatus in accordance with one of the preceding claims, characterized in that the transport cylinder (11) is embodied as a folding blade cylinder (11).